

ABSTRACT OF THE DISCLOSURE

A capacitor forming method can include forming an insulation layer over a substrate and forming a barrier layer to threshold voltage shift inducing material over the substrate. An opening can be formed at least into the insulation layer and a capacitor dielectric layer formed at least within the opening. Threshold voltage inducing material can be provided over the barrier layer but be retarded in movement into an electronic device comprised by the substrate. The dielectric layer can comprise a tantalum oxide and the barrier layer can include a silicon nitride. Providing threshold voltage shift inducing material can include oxide annealing dielectric layer such as with N_2O . The barrier layer can be formed over the insulation layer, the insulation layer can be formed over the barrier layer, or the barrier layer can be formed over a first insulation layer with a second insulation layer formed over the barrier layer. Further, the barrier layer can be formed after forming the capacitor electrode or after forming the dielectric layer, for example, by using poor step coverage deposition methods.

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